Tania R. **Allard**

Research Software Engineer · Data Scientist

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Profile

Formerly Tania Sanchez Monroy. Eligible to work in the UK. A passionate innovator with experience in bringing new technology to bear on complex research challenges. Skilled in data collection, processing, analysis and visualisation. Strong communication skills and able to present abstract concepts in an accessible way to all organisational levels. Passionate about open science, reproducibility, and diversity and inclusion in STEM areas. Sustainability and open source advocate and contributor.

Education

The University of Manchester

Manchester, UK

PhD in Materials science / computational modelling

Jan 2013 - Dec 2016

Thesis: Modelling and characterisation of compliant and hydrated materials. Supervised by Prof. Brian Derby

- Developed algorithms and data analysis pipelines to model the behaviour of biological tissues in Python and R. Such algorithms reduced the computational time by 70% as well as the associated errors by 30% compared to the state of the art.
- Developed a sophisticated data acquisition and preservation strategy for real life data sets between 2 and 25GB size. These were posteriorly analysed using complex data analysis pipelines and classification algorithms in Python and R (numpy, pandas, scikit-learn, tidyverse).
- Interpreted complex simulation data using statistical methods implemented in R.
- Worked in a cross-disciplinary team to develop a unique multi-scale simulation technique and implemented the methodology to explain complex biological phenomena using own generated computational scripts and packages written in Python, FORTRAN, MATLAB and C++.

UNAM

Mexico City, Mexico

BEng in Mechatronics engineering

Aug 2016 - May 2011

Topics covered include: multivariate calculus, statistics, linear algebra, robotics, automation and control, design, mechanics of solids, fluids mechanics, electronics. Major: computational modelling and medical devices

Relevant Experience

The Python Software Foundation

UK/USA

Blogger

March 2018-present

- Wrote blog posts for the Python Software Foundation main blog, reaching the worldwide Python community.

The University of Sheffield

Sheffield, UK

Research software engineer / Machine learning team member

Nov 2016 - present

- Main contributor to the European funded projects OpenDreamkit as well as to a number of open source projects, such as project Jupyter, GPy for Gaussian Processes, RopenSci, among others.
- Used RESTful web design using Flask, Jinja2, JQuery, JS and Django for the development of multiple web apps.
- Developed numerous data analysis pipelines, from wrangling to prediction and results dissemination, for research projects in Linguistics (Natural Language Processing), Bioinformatics (Classification and regression), Materials science (regression), and Geography (geolocation data analysis) using R and Python.
- Implemented the use of third parties API's and web scraping to collect raw data for posterior analysis and modelling.
- Trained and supervised junior colleagues and students, with a particular focus on reproducible workflows, software development best practices, High-Performance Computing, and open source projects.
- Worked in policy creation at both, a national and international level as member of the UK Research Software Engineering and NUMFocus Diversity and Inclusion in Scientific Computing committees.
- Developed interactive dashboards and data visualizations using d3.js, Shiny, Bokeh, and Plotly to disseminate project findings.

NHS, Manchester business school

Manchester, UK

Consultancy fellow

February - October 2016

- Liaised with multiple stakeholders, from high-level directors to patients within the NHS to identify organisational needs.
- Led data collection initiative and performed the statistical analysis of the collected data. This allowed to assess the efficacy of the Healthier Together programme and predict both desired and undesired outcomes of resources reallocation.
- Developed a framework for specialist hospitals within the Greater Manchester area to improve the sharing of institutional knowledge, improving efficiency of communication, and eliminating 50% of unnecessary meetings.

The University of Manchester *Manchester, UK*

Foundation year mentor / Teaching assistant *January 2013 - December 2016*

- Foundation tutor: lead teams of 5-6 people across the full length of the research projects: from the literature review, to experimental design, to results reporting.
- Developed classes materials and delivered lectures / tutorials on: MATLAB, Finite Element Analysis, Data analysis, Mechanical testing, statistics.

University of Southern California, MEMS *California, USA*

Engineering intern *2011*

- Performed real-time data collection and analysis for implantable drug delivery devices. The implemented models allowed for 20% increase in dose tracking and fault detection accuracy.
- Architected and implemented analytics and visualization components for a device data analysis platform to predict potential hardware failures.

Skills

Experienced open source developer with a specialization in scientific computing, including visualization, data analysis, and practical machine learning.

Programming languages	Python, R, C/C++, MATLAB, Fortran, Unix / Linux shell (bash) , Julia
Web technologies	HTML, css/sass, Flask, jQuery, Jinja, Django, JavaScript
Data science and data analysis	R, Sickit-learn (Python), SciPy, Pandas, Numpy, Spark
Software engineering	git, Heroku, code review, profiling and optimisation, APIs, Docker, Travis CI
Productivity tools	LaTeX, IPython, Jupyter notebooks , R markdown
Machine learning	Linear/logistic regression, Clustering, k-NN, Random Forests, PCA, NLP, Decision trees
Visualisation and reporting	D3.js, Bokeh, Seaborn / Matplotlib, Plotly, Shiny, ggplot, Dash, vega-lite
Cloud solutions	Microsoft Azure, Amazon Web Services
CAD/ CAM/ FEA	Abaqus, Ansys, CATIA, SolidWorks
Engineering / mathematical software	LabView, SIMULINK, MATLAB (incl. optimisation toolbox), Mathematica
Languages	Spanish (mother), English (proficient), French (intermediate)

Professional activities

PyCon Charlas chair, PyCon US	2018
Assessment group member, DISC NUMFOCUS	2018
Mentor, Hackmed and HackSheffield	2018
Maintainer, Software Carpentry Python Ecology Lesson	2018
ELife ambassador, ELife Innovation	2018
Open source / working in the open mentor, Mozilla Open Leaders	2018
Core committee member; Surveys and community, RForwards	2017-18
Diversity chair, Juliacon	2017-18
Reviewer, ReScience	2017-18
Reviewer, Journal of Open Source Software (JOSS)	2017-18
Elected member, UK Research software engineering committee	2017-18
Data scholar, Data study workshop: Alan Turing Institute	2017
Diversity and equality chair, Talks co-chair, 2nd Research Software Engineering Conference	2017
Diversity and equality committee member, Computer Science, University of Sheffield	2016-18
Lead Python Instructor: Manchester and Sheffield, Code First Girls	2017-18
Talks co-chair, 2nd Research Software Engineering Conference	2017
Supporting organiser, Nanoprinting conference	2016
Cultural affair officer, Manchester Mexican Society	2015
Cultural affairs officer, Mexican Society in the UK	2014
Volunteer, Manchester Girl Geeks, The British Science Association, Coding Dojo	2013-17

Talks and workshops

Feb 2018	**Her + data**, The importance of community in the use of data	*Manchester, UK*
Oct 2017	**Manchester R user group**, What has reproducibility ever done for us?	*Manchester, UK*
Sep 2017	**RSE conference**, Workshop: Reproducible data analysis using Jupyter notebooks	*Manchester, UK*
Jun 2017	**Machine Learning retreat**, Reproducible ML workflows	*Sheffield, UK*
Apr 2017	**Nanobruecken** , Characterisation of thin hydrated films	*Germany*
Dec 2015	**MRS Fall** , Viscoelastic and poroelastic charcterisation and modelling of thin films	*Boston, USA*
Jun 2015	**Biomaterials showcase**, Modelling the mechanical properties of compliant and hydrated films	*MAnchester, UK*
Apr 2015	**Nanobruecken** , Modelling the viscoelastic properties of PDMS	*Germany*
Jan 2015	**Winter School, UNAM Engineering faculty**, Nanomecanica de materials biologicos (invited talk)	*Mexico*
Jun 2013	**Wrigtington Gold Medal**, Optimised pre-operative planning for elbow arthrolysis	*Wigan, UK*